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THE TITRATION OF *CLOSTRIDIUM PERFRINGENS* (WELCHII) ANTITOXIN BY ITS ANTIHEMOLYTIC ACTIVITY[1]

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In active immunization against gas gangrene infections a criterion for immunity is the presence of circulating antitoxin in the serums. Because of its enzymatic nature *Clostridium perfringens* toxin lends itself to various "in vitro" procedures for its titration. The inhibition of this activity by perfringens antitoxin makes possible the in vitro titration of antitoxin. In 1928 Mason and Glenny (*1*) proposed the titration of toxin and antitoxin by a hemolytic method, using sheep red blood cells as the indicator. However, they did not differentiate the alpha and theta toxins, the two hemotoxins which are produced by *Cl. perfringens*. In 1939 Nagler (*2*) and Seiffert (*3*) showed independently that perfringens toxin would produce an opalescence in normal human serum. Nagler found that it could be specifically inhibited by the antitoxin and he applied the reaction to the titration of toxin and antitoxin. Macfarlane et al. (*4*) extended these observations and found that the opalescence was due to the digestion of the serum lipoproteins by the toxin. They found that this lecithinase activity could be demonstrated better by the action of toxin on egg yolk, and that ionized calcium was essential for the reaction.

The lecithinase activity has been studied by many other workers. Van Heyningen (*5*) has proposed an egg turbidimetric test for titrating toxin, antitoxin, and toxoid. Macfarlane and Knight (*6*) have used a chemical procedure whereby the acid-soluble phosphorus liberated by the action of the lecithinase on a lecithin substrate is determined and applied to the toxin-antitoxin titration.

Oakley and Warrack (*7*) made comparative studies between the opacification of lecithovitellin and the hemolytic activity. They were able to demonstrate the effect of calcium on hemolysis as well as on the opacification of lecithovitellin. They used sheep red blood

[1] From Biologics Control Laboratory, National Institute of Health.

cells as their indicator for hemolytic activity and found variations in the time of lysis of the cells depending on the toxin used. They attributed this to the amount of peptone present in the toxin.

The standard procedure for titrating perfringens antitoxin is the toxin-antitoxin neutralization test as measured in the mouse. Many laboratories, however, use in vitro tests for preliminary work and the mouse test only for the final check. For antitoxin of high titer, where it is possible to make dilutions in saline, the egg turbidimetric test has been found to be of great use and to give good correlation with the mouse test.

In using perfringens toxoid for the active immunization of either laboratory animals or human beings the antitoxin titer obtained in the serum is comparatively low. In attempting to apply the egg turbidimetric test to the testing of the undiluted serum for its antitoxin content we have obtained very unsatisfactory results. The lecithinase activity of the toxin, as demonstrated by the egg turbidimetric test is masked by some normal serums; this masking is in no way related to antitoxin content. With serum having a high enough antitoxin level so that dilutions can be made this masking effect is removed. Robertson and Keppie (*8*) in attempting to use the egg turbidimetric test for testing serum of low antitoxin value also observed that this method has its limitations. They felt that the masking was due to interference by the amount of serum protein present in undiluted serum.

The break-down of the lecithin by the lecithinase is not inhibited by normal serum but only the appearance of the opacity. The lecithinase activity can be demonstrated by determining the amount of acid-soluble phosphorus liberated from the lecithin or by the hemolysis of red blood cells, as will be shown.

Various workers (*9*, *10*, *11*, *12*, *13*, *14*), have shown that perfringens toxin is composed of at least two factors, both of which are hemolytic for red blood cells but which differ considerably in their mode of action. These two factors have been designated by the British workers (*15*) as *alpha* and *theta* toxins. Both are lethal for mice and are antigenic, giving rise to specific antitoxins (*9*, *14*, *16*). We have shown that the formation of *theta* hemolysin is inhibited by the presence of lipoids. Whether *theta* toxin is produced in the body during infection is a matter which is undetermined. In this report we are concerned only with the titration of an antitoxin which protects against the *alpha* component.

PROCEDURE

In titrating *alpha* toxin and antitoxin by the mouse test the mice which die from the action of the *alpha* toxin always show a marked hemoglobinuria. This is not necessarily the case with other animals

dying of perfringens intoxication. For this reason mouse red blood cells were chosen as the indicator for showing the presence of free toxin in toxin-antitoxin mixtures in the following hemolysin titration. The mice were bled from the axillary blood vessels, using sodium citrate as an anticoagulant. The cells were washed twice and made to a 2-percent suspension in an isotonic solution of sodium chloride. Enough blood can be obtained from 5 or 6 mice for 30 to 40 serum titrations.

The procedure for the hemolysin titration is the same as that used for the mouse intravenous test except that instead of testing for free toxin by mouse injection, its presence is determined by the lysis of the mouse red blood cells. With the mouse test, in checking serums for the presence of small amounts of antitoxin a constant amount of undiluted serum (0.1 ml.) was used against varying quantities of an *alpha* toxin, the "test doses" of toxin representing various fractions of antitoxin units having been determined with the standard antitoxin. Each was made to volume with isotonic solution of sodium chloride, allowed to stand for 1 hour at room temperature, and then 0.5-ml. quantities of the mixtures were injected into mice. For the hemolysin test 0.5 ml. of a 2-percent suspension of washed mouse red blood cells was added to each of the 0.5 ml. of the toxin-antitoxin mixtures, after having incubated 1 hour at room temperature, and the mixtures contained in agglutination tubes were incubated in a 37° C. water bath for 1 hour. A protocol of such a titration is shown in table 1.

TABLE 1.—*A protocol on the mouse intravenous method and the hemolysin test for titrating perfringes antitoxin*

Units antitoxin tested for per ml. serum		1.0	0.5	0.2	0.1
Toxin-antitoxin	Serum (ml.)	0.1	0.1	0.1	0.2
	Toxin (mg.)	1.32	0.66	0.38	0.38
Mouse test [1]		0/2	1/2	2/2	2/2
Hemolysis [2]		4+	2+	−	−

[1] The denominator denotes the number of mice inoculated and the numerator the number of mice surviving.
[2] A 4+ denotes complete hemolysis of 0.5 ml. of a 2-percent suspension of washed mouse red blood cells; a negative a complete lack of lysis.

Over 300 human serums and 100 guinea pig serums have been compared by the mouse toxin-antitoxin neutralization test and by hemolysin titration. In every instance toxin-antitoxin mixtures giving a 4 plus hemolysis caused death in both of two mice injected, similarly both of two mice survived with toxin-antitoxin mixtures giving a negative hemolysis. With a 2 plus and 3 plus hemolysis generally one of the two mice injected would survive. Table 2 shows the correlation obtained with a representative number of serums tested.

TABLE 2.—*To show the correlation between the mouse toxin-antitoxin neutralization test and the hemolysin titration of a representative group of human serums*

Serum.	Hemolysin titration				Mouse test			
	Units antitoxin tested for per ml. serum				Units antitoxin tested for per ml. serum			
	1.0	0.5	0.2	0.1	1.0	0.5	0.2	0.1
8799	4+	4+	4+	4+	0/2	0.2	0.2	0.2
8847	4+	4+	3+	.....	0/2	0/2	0/2	2/2
8971	.....	.....	.....	.....	2/2	2/2	2/2	2/2
9214	4+	4+	4+	4+	0/2	0/2	0/2	0/2
9302	4+	4+	3+	−	0/2	0/2	1/2	2/2
A	4+	−	−	−	0/2	2/2	2/2	2/2
9197	4+	4+	4+	2+	0/2	0/2	0/2	2/2
9842	4+	4+	1+	−	0/2	0/2	1/2	2/2
9802	4+	4+	3+	−	0/2	0/2	1/2	2/2
8793	4+	2+	−	−	0/2	0/2	2/2	2/2
10236	4+	3+	−	−	0/2	0/2	2/2	2/2
9198	4+	4+	4+	−	0/2	0/2	0/2	2/2
C	4+	−	−	−	0/2	2/2	2/2	2/2
9584	4+	3+	−	−	0/2	0/2	2/2	2/2
10014	−	−	−	−	2/2	2/2	2/2	2/2
10164	4+	4+	3+	−	0/2	0/2	1/2	2/2
10083	4+	4+	3+	−	0/2	0/2	0/2	2/2
9704	4+	4+	±	−	0/2	0/2	2/2	2/2
10333	4+	4+	4+	2+	0/2	0/2	0/2	1/2
9674	2+	−	−	−	1/2	2/2	2/2	2/2

When the standard antitoxin diluted 1:50 in saline was tested by the hemolytic titration, using the same red blood cell suspension, toxic doses were found to be nonhemolytic. However, when normal serum was added, the toxic doses became markedly hemolytic. It was believed that normal serum activated the toxin because of some reducing effect. However, various reducing agents tested showed no activation of the *alpha* toxin as shown in table 3.

TABLE 3.—*To show the effect of normal serum and of reducing substances on the hemolysis of mouse red blood cells by alpha toxin*

Toxin in mg.	.01	0.2	.04	.08	.16	.32
Toxin only	−	−	−	−	−	±
Toxin+thioglycollate	−	−	−	−	−	±
Toxin+glutathione	−	−	−	−	−	±
Toxin+cysteine	−	−	−	−	±	2+
Toxin+sodium formaldehyde sulf-oxylate	−	−	−	−	−	±
Toxin+thioglycol	.....	.....	.....	.....	.....	±
Toxin+normal guinea pig serum	3+	4+	4+	4+	4+	4+

Macfarlane et al. (*4*) and Oakley and Warrack (*7*) found that Ca++ was essential in the lysis of sheep red blood cells by *alpha* toxin. Since sodium citrate was used as an anticoagulant for the mouse blood and since citrates are known to depress the ionization of calcium salts, the effect of adding Ca++ was studied. From table 4 it will be seen that calcium is essential for both types of hemolysis and that there is an optimum calcium concentration. Although the blood cells were washed twice sufficient citrate remained to inhibit hemolysis in the absence of added calcium.

Theta toxin was not activated by the addition of calcium, as is shown in table 5.

TABLE 4.—*To show the effect of calcium on the hemolysis of twice-washed red blood cells, obtained from citrated blood, by alpha toxin*

$CaCl_2$ added per tube (mg.)	.01	.02	.03	.04	.05	.06	.07	.08	.09	0.1
Hemolysis of mouse red blood cells after 1 hour of incubation at 37° C.										
	Toxin in milligrams									
5.0	−	3+	4+	4+	4+	4+	4+	4+	4+	4+
0.5	−	3+	4+	4+	4+	4+	4+	4+	4+	4+
0.1	3+	4+	4+	4+	4+	4+	4+	4+	4+	4+
0.05	+	4+	4+	4+	4+	4+	4+	4+	4+	4+
0.01	+	2+	2+	3+	3+	4+	4+	4+	4+	4+
None	−	−	−	−	−	−	−	−	−	−
Hemolysis of sheep red blood cells after 1 hour of incubation at 37° C.										
5.0	−				±	±	±	±	±	+
0.5	−		±	±	±	±	±	±	±	+
0.1	−	±	±	±	±	±	±	±	±	±
0.05	−	±	±	±	±	±	±	±	±	±
0.01	−		±	±	±	±	±	±	±	±
None	−	−	−	−	−	−	−	−	−	−
Hemolysis of sheep red blood cells after 1 hour of incubation at 37° C., then overnight in a cold room										
5.0	−	−	+	2+	3+	3+	3+	3+	3+	3+
0.5	2+	4+	4+	4+	4+	4+	4+	4+	4+	4+
0.1	2+	4+	4+	4+	4+	4+	4+	4+	4+	4+
0.05	2+	4+	4+	4+	4+	4+	4+	4+	4+	4+
0.01	−	2+	3+	4+	4+	4+	4+	4+	4+	4+
None	−	−	−	−	−	−	−	−	−	−

TABLE 5.—*To show that calcium is not necessary for the hemolysis of red blood cells by theta toxin*

Toxin in mg.	.01	.009	.008	.007	.006	.005	.005	.003	.002	.001	.0009
Mouse red blood cells (citrated)	4+	4+	4+	4+	3+	3+	3+	3+	3+	3+	3+
Mouse red blood cells+1 mg. $CaCl_2$ per tube	4+	4+	4+	3+	3+	3+	3+	3+	3+	3+	3+
Sheep red blood cells (citrated)	4+	4+	4+	4+	4+	4+	4+	4+	4+	4+	3+
Sheep red blood cells+1 mg. $CaCl_2$ per tube	4+	4+	4+	4+	4+	4+	4+	4+	4+	4+	3+

SUMMARY

A hemolysin test using mouse red blood cells for titrating serums of low *alpha* antitoxin content is described.

Ionized calcium was found essential for the lysis of both mouse and sheep red blood cells by *alpha* toxin.

Sufficient calcium was found to be present in 0.1 ml. of undiluted serum to neutralize the effect produced by using sodium citrate as an anticoagulant as described in the test.

A very good correlation was found between the mouse protection test and the hemolysin test.

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PRELIMINARY REPORT ON THE IDENTIFICATION OF 2,2 BIS(P-CHLOROPHENYL)-1,1,1 TRICHLORETHANE (DDT) IN THE EXCRETA OF POISONED RABBITS [1]

By E. F. Stohlman, *Associate Pharmacologist, United States Public Health Service*

Having devised a method (*1*) for the quantitative estimation of organic chlorine in body tissues, fluids, and excretions of animals receiving DDT, it seemed desirable to study in some detail its metabolism. It was soon found that the rabbit best suited this purpose. Crystalline DDT has now been isolated both from the urine and feces of rabbits receiving the compound by oral administration.

[1] From the Division of Pharmacology, National Institute of Health

EXPERIMENTAL

Normal healthy rabbits, placed in individual metabolism cages, were maintained on oats and cabbage throughout the entire experimental period. Before being used for this purpose they underwent a preliminary observation for 2 weeks.

Since the chlorine content of DDT is almost 50 percent, the excretion of DDT or degradation products was calculated as DDT equivalent by multiplying the amount of chlorine obtained by a factor of 2 after deducting 0.1 mgm. This amount was routinely allowed to compensate for the limitations of the method and the experimental error. Preliminary analysis of the urine of normal rabbits did not yield more than 0.1 mgm. chlorine per day.

Single administrations of DDT in a 5-percent solution in olive oil were given by stomach tube to rabbits. The excreted DDT was estimated by the previously reported analytical procedure (*1*).

Urinary elimination.—Attempts to identify DDT and to separate it from other possible decomposition products have met with some success. During the course of this work it was observed that rabbits excreted in the urine an ether-soluble organic chlorine compound in highest concentration during the period between 24 to 96 hours after administration of a maximum tolerated dose of DDT (*2*). Therefore, a group of normal rabbits were given 400 mgm. per kilo DDT, and the urines collected daily. The first 24-hour specimens were discarded as were any feces-contaminated later specimens. The urines were pooled, and acidified with glacial acetic acid to a pH of 4.8 or less. This ordinarily required from 0.05 to 1.0 cc. glacial acetic acid per 100 cc. of urine. The urine was then extracted four times with a total volume of U. S. P. ether equivalent to that of the urine volume.

The combined ether extractions were pooled and dehydrated with anhydrous sodium sulfate. Due to heavy emulsions, large quantities were usually needed, varying from about 50 to 100 gm. per 100 cc. of ether used in the extraction. The dehydrated ether was then washed three times with small amounts of distilled water and each washing tested for inorganic chloride. Usually the first washing removed all but mere traces of inorganic chloride from the ether solutions.

The acid ether extract was next evaporated to dryness on a steam bath with a current of air. The residue was taken up in absolute alcohol and an aliquot reduced with metallic sodium as outlined in a previous publication (*1*). The remaining alcoholic extract was then evaporated as described above.

The residue was taken up with ether and transferred to a separatory funnel, using 25 cc. of ether for each 100 cc. of original urine volume. Next the ether was extracted with four 10-cc. portions of distilled water, after adding sufficient sodium carbonate to give a pH of 8.0.

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During these extractions much of the ether-soluble pigment went into the aqueous phase.

This procedure served to divide the organic chlorine-bound substances into an ether-soluble fraction (fraction No. 1), and an alkaline water-soluble fraction (fraction No. 2).

Calculated as DDT equivalent 35 to 60 percent was found in the ether-soluble fraction and the remainder in the alkaline water solution. However, the indications are that these proportions vary with the size of the dose of DDT administered and the length of time following administration.

On acidification with glacial acetic acid to a pH of 4.8 the alkaline water fraction again became ether soluble and could be reextracted. To do this four extractions with ether were made, using two volumes of ether for each volume of water solution for every extraction.

Following this procedure a 768-cc. pooled urine specimen, representing the 48- to 96-hour urine collections of six rabbits each having received 400 mgm. per kilo DDT, was extracted with ether. Organic chlorine determination of an aliquot of the ether extract showed a total of 102 mgm. DDT equivalent extracted from this specimen. Separation of the remainder into two fractions, as outlined above, showed about 50 mgm. DDT equivalent in fraction No. 1, and approximately 43 mgm. in the alkaline water soluble fraction No. 2, the identity of which has not yet been determined.

For comparison a control experiment was carried out in which catherized normal rabbit urines were used. To 900 cc. of a pooled urine specimen having a pH of 7.4, 135 mgm. of DDT was added as a 1-percent solution in acetone. Glacial acetic acid was added to a pH of 4.8. The urine was then extracted and dehydrated as in the foregoing. Reduction of an aliquot of the ether extract in absolute alcohol showed a total of 95 mgm. DDT equivalent, extracted from the urine. This is about 70 percent of the added DDT recovered. Separation of this into two fractions, as outlined above, showed 87.5 mgm. in the ether-soluble fraction No. 1, or about 95 percent. There was not over 4 mgm. of DDT equivalent in the acidified, ether-extracted, alkaline water-soluble fraction, and none in the extracted water solution.

Isolation of crystalline DDT from the ether-soluble fraction.—Crystals were obtained from the ether-soluble fraction No. 1 by repeated crystallizations from approximately 80 percent hot ethyl alcohol. After seven recrystallizations less than 10 percent of the amount in this fraction was obtained in a relatively pure form. This material had a melting point of 106°–107° C. A mixed melting point with pure DDT showed no depression. A microcombustion analysis after drying to constant weight gave carbon 47.91, hydrogen 2.92; as calculated for DDT, carbon 47.43, hydrogen 2.56.[2]

[2] Microanalyses were made by Dr. A. T. Ness, Chemistry Laboratory, National Institute of Health.

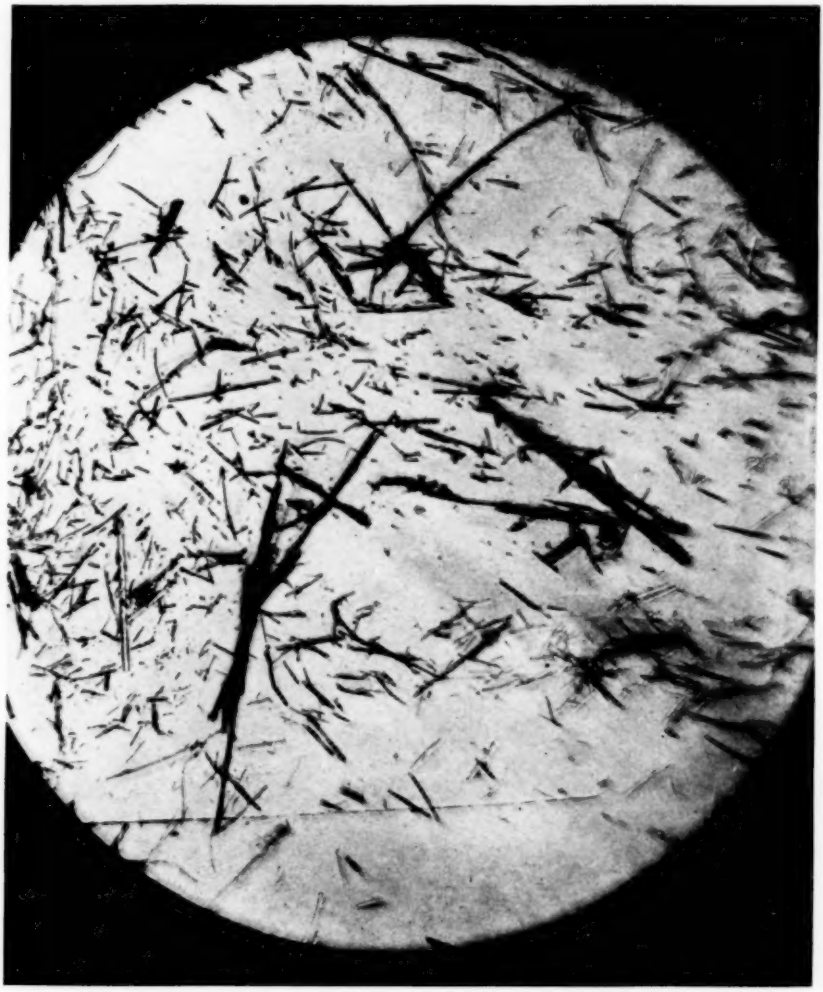

FIGURE 1.—Crystals of the ether-soluble fraction No. 1.

Work is in progress on the isolation and identification of the alkaline water-soluble fraction No. 2.

Isolation of crystalline DDT from the feces.—Crystals were obtained from the feces of rabbits which had received DDT in olive oil by mouth.

The feces were extracted with dioxane, and filtered. The brown-colored filtrate was evaporated on a steam bath and a current of air until a syrupy semiliquid residue was obtained. This residue was treated with anhydrous disodic sodium and dissolved in U. S. P. ether. The ether was washed free of inorganic chloride with distilled water. It was then shaken with a few cubic centimeters of dilute sodium hydroxide solution whereupon a heavy emulsion formed. A small amount of glacial acetic acid, just sufficient to acidify the water phase and to break the emulsion, was added. This caused the greater part of the ether-soluble oily residue to separate from the ether solution. After separation, the ether solution was washed with distilled water and evaporated to a small, light-yellow, oily residue. This was placed in a desiccator over calcium chloride and beside a container of concentrated sulfuric acid. After 24 hours the material crystallized into needles which appeared microscopically identical with pure DDT crystals. These melted at 104° C., the low melting point probably being due to some contaminant. Analysis of the crystals showed the presence of organically bound chlorine. Some 50 percent of the organically bound chlorine extracted from the feces was obtained in crystalline form.

SUMMARY AND CONCLUSIONS

Crystalline DDT has been isolated from the urine of the rabbit, after receiving DDT by mouth. Another fraction containing organic chlorine is soluble in water made alkaline with sodium carbonate and can be reextracted with ether after acidification. Work on the isolation and purification of the latter fraction is in progress.

Crystals containing organic chlorine have been obtained from the feces of rabits receiving DDT by mouth. These crystals appear to be unchanged and probably unabsorbed DDT.

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PSITTACOSIS

Occurrence in the United States and Report of 97 Percent Mortality in a Shipment of Psittacine Birds While Under Quarantine

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Psittacosis is primarily a disease of birds, principally of species of the psittacine family, but it is conveyed secondarily to man, usually through contact with infected birds. Epidemiological studies indicate that it is not only highly communicable from bird to bird and from bird to human beings, but that it is also communicable to a lesser degree from man to man. The disease was identified and parrots were incriminated in its transmission in Europe (*1*) as early as 1879, and the causative organism was erroneously thought to have been isolated by Nocard in 1893 (*2*, *3*). The first description of a human case is stated to have been given by Ritter in 1879 (*1*), and since then reports of sporadic outbreaks in many countries have appeared. The true nature of the etiologic agent, however, was not recognized until the widespread epidemic in 1929–30, which led a number of investigators both in this country (*4*) and abroad to undertake a thorough reinvestigation of the problem. Up to that time it was believed that the causative organism was one of the *Salmonella* group. It has now been established that psittacosis is the result of an infection with a filterable virus.

Psittacosis infection in the Western Hemisphere probably originated in the tropics, where the disease is endemic among birds of the psittacine family. It has at times become rather widely distributed in the United States. Human cases were probably first reported in this country by Vickery and Richardson in 1904 (*5*) and by Scott in 1906 (*6*). The first extensive outbreak in the United States was that of 1929–30, in which 74 foci of infection were recorded, and which gave rise to 170 reported cases with 33 deaths during the period November 23, 1929, to December 31, 1930. These cases were distributed in 16 States and the District of Columbia and are exclusive of 16 laboratory infections, with 2 deaths, and of 12 probable cases which were removed from 2 merchant ships that entered United States ports. In these latter cases the patients were exposed aboard ship to parrots which had been purchased in Germany and Brazil (*7*). During the period 1931–42, inclusive, there were 210 cases reported in the United States, with 47 deaths, 74 of these cases occurring in 1932.

The 1929–30 outbreak aroused great interest in this disease, which was being imported into and disseminated throughout the United

[1] Medical Director, Chief, Division of Foreign Quarantine.
[2] Division of Public Health Methods.

States, and the first measures for preventing such importation were adopted. By Executive Order (No. 5264) dated January 24, 1930, the introduction of parrots into the United States, its possessions and dependencies, from any foreign port was prohibited for such a period of time as deemed necessary, except under such conditions as should be prescribed. On February 3, 1930, regulations governing the importation of parrots, in accordance with the provisions of the Executive order, were approved. These regulations have been amended from time to time, the latest revision being that of April 28, 1939. On December 20, 1933, the interstate quarantine regulations were amended to provide for the control of interstate shipment of psittacine birds. Such shipments were prohibited unless accompanied by a certificate issued by the State health authority stating that, to the best of the knowledge and belief of such authority, the birds had come from an aviary free from psittacosis infection, and providing that no bird of the psittacine species named that was under 8 months of age should be offered or accepted for shipment in interstate traffic.

The adoption of these regulations was followed by a reduction in the numbers of cases of psittacosis reported in the United States. The following table lists the numbers of cases of, and deaths from, psittacosis reported in the United States from 1929 to 1942:

Year	Cases	Deaths	Year	Cases	Deaths
1929–30	170	33	1938	4	3
1931	22	8	1939	9	2
1932	74	12	1940	8	3
1933	15	3	1941	12	1
1934	22	9	1942	32	4
1935	8	1			
1936 (no reports)		0	Total	380	80
1937	4	1			

The figures for cases have been compiled from reports of investigations of the 1929–30 outbreak and from monthly reports received by the Public Health Service from the State health officers, and are obviously incomplete. The deaths are taken from reports of the Bureau of the Census. As the diagnosis of psittacosis may be difficult in cases occurring where there is no epidemic or where no history of association with sick birds is obtained, no doubt there are many undiagnosed or incorrectly diagnosed cases.

As an indication of the highly communicable character of psittacosis among birds, and as a suggestion of the implications regarding the results that might follow the unrestricted importation and interstate shipment of birds of the psittacine family, a recent report of the experience at a quarantine station of the Public Health Service is of interest.

In accordance with the provisions of the quarantine regulations regarding the importation of psittacine birds, 113 mixed Amazon

parrots and parrakeets entered quarantine at Brownsville, Tex., on June 1, 1944. Reports of the deaths of 108 of the birds in this shipment were received as follows:

Date (1944)	Number of birds			Date (1944)	Number of birds		
	Total	Amazon parrots	Parrakeets		Total	Amazon parrots	Parrakeets
June 27	4	2	0	Aug. 30	18	17	1
July 8	6	6	0	Sept. 5	6	6	0
July 19	13	12	2	Sept. 16	16	16	0
July 27	13	11	1	Sept. 26	13	13	0
Aug. 1	7	7	2				
Aug. 9	12	10	0	Total	108	100	8

The dead birds were shipped to Dr. Karl F. Meyer, Director of the Hooper Foundation in San Francisco, where the presence of psittacosis virus was first confirmed in an Amazon parrot (No. 91) that died September 7. The virus was recovered from material taken from the spleen and liver of this parrot. The bird was very emaciated. Under date of November 5 Dr. Meyer reported two additional birds proved positive for psittacosis virus by mouse inoculation. As the birds died, shipments were made to Dr. Meyer, but recovery of the virus in many of them was complicated by the presence of *Salmonella* organisms throughout the organs of the birds. The anatomical lesions of large spleens and livers with and without necrosis in these birds strongly suggested the presence of psittacosis virus, but the inoculated animals died of bacterial contamination.

By the time of receipt of the first positive evidence that the shipment of birds was infected with psittacosis, all birds had died except one Amazon parrot and two parrakeets, a mortality rate of 97 percent. The remaining birds were sacrificed and shipped to the National Institute of Health, where the prescence of psittacosis virus was established in all three specimens.[3]

The finding of *Salmonella* organisms disseminated throughout the organs of some of the birds suggests the possibility that these organisms may have accounted for part of the mortality. Be this as it may, the demonstrated presence of both psittacosis and *Salmonella* infection in the same shipment of psittacine birds directs attention toward two potential health hazards that may be encountered by those who come in contact with such birds or their surroundings.

[3] A report has been received of a high mortality in another shipment of 51 parrots while in quarantine at Brownsville, Tex. The bodies of 4 birds which died and of 3 which were killed were sent to the National Institute of Health. Preliminary studies indicate that all 4 birds which had died were infected with psittacosis. Of the 51 birds in the shipment, 48 died while in quarantine, and 3 were killed. Studies in the isolation of the psittacosis agent in other birds of this shipment are being conducted at the National Institute of Health and by Dr. K. F. Meyer, Director of the Hooper Foundation for Medical Research, San Francisco, Calif.

Cases of psittacosis in the United States have usually been contracted from recently imported birds, although it has been demonstrated that the infection is present in some aviaries in this country devoted to the raising of psittacine birds, especially parrakeets. Theoretically, the prevention of psittacosis is simple so far as the individual is concerned, that is, by the avoidance of all contact with susceptible birds. Birds which are apparently well occasionally transmit the infection. General regulations must be directed toward total exclusion or toward preventing the importation of infected birds and their further dissemination of the infection within the United States. This latter involves strict control of traffic in birds of the parrot family together with quarantine and laboratory examination of imported birds, and can hardly be expected to be completely effective. As the birds involved are favored as pets by many persons in the United States, the methods so far employed have been directed toward rendering the traffic in psittacine birds as harmless as possible rather than toward preventing it entirely. However, more drastic measures may sometimes be justified and necessary in order to control this imported disease which, while not so important numerically as a cause of death, will probably continue to occur both sporadically and in epidemic form unless adequate measures are employed by both the Federal and State authorities. Several States have already enacted laws or adopted regulations, and some cities have enacted ordinances, regarding psittacine birds and the operation of aviaries, which have for their purpose the prevention and control of psittacosis. It is to the interest of importers and dealers to cooperate to the fullest in the application of measures adopted for the control of the disease.

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PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED MARCH 10, 1945

Summary

A total of 284 cases of meningococcus meningitis was reported for the current week, as compared with 267 last week, 517 for the corresponding week last year, and a 5-year (1940–44) median of 88. Seven States reported an aggregate of 136 cases, or 48 percent of the total, as follows: New York 29, Pennsylvania 26, Ohio and Illinois 16 each, Michigan 14, Texas 15, and California 20. The total for the year to date is 2,548, as compared with 5,590 and 4,040 for the corresponding periods of 1944 and 1943, respectively, and a 5-year median of 661. The peak of incidence of this disease is usually reached before the end of March.

Of the current total of 34 cases of poliomyelitis, 14 occurred in New York (2 in New York City), 4 in Texas, 3 in Tennessee, and 13 in 11 other States. The largest number of cases recorded for any prior corresponding week was 31, reported in 1928. The cumulative total is 375 cases, as compared with 243 and 276, respectively, for the corresponding periods of last year and 1943, and a 5-year median of 276.

A slight decline was recorded in the incidence of scarlet fever. The total number of cases reported for the week was 6,413, as compared with 6,425 last week, 6,945 for the corresponding week last year, and a 5-year median of 5,024. Nearly half of the current total (3,165 cases) occurred in the Middle Atlantic and East North Central areas, but 376 cases were reported in Massachusetts, 252 in Maryland, and 488 in California.

Cumulative figures for the first 10 weeks of the year for certain other diseases are as follows (last year's figures in parentheses)—incidence above that of last year: *Diphtheria* 3,162 (2,547), *dysentery (all forms)* 7,003 (2,929), *tularemia* 208 (101), *endemic typhus fever* 547 (417), *whooping cough* 23,430 (18,335), *undulant fever* 854 (380). Incidence below that for last year: *infectious encephalitis* 66 (102), *influenza* 43,198 (310,953), *measles* 20,173 (207,252), *smallpox* 94 (136), *typhoid and paratyphoid fever* 568 (746).

A total of 9,593 deaths was recorded for the week in 93 large cities of the United States, as compared with 9,866 last week, a 3-year (1942–44) average of 9,802, and 9,548 for the corresponding week last year. The total for the year to date is 97,851, as compared with 103,672 for the same period last year.

Telegraphic morbidity reports from State health officers for the week ended March 10, 1945, and comparison with corresponding week of 1944 and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred.

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44
	Mar. 10, 1945	Mar. 11, 1944		Mar. 10, 1945	Mar. 11, 1944		Mar. 10, 1945	Mar. 11, 1944		Mar. 10, 1945	Mar. 11, 1944	
NEW ENGLAND												
Maine	0	0	0	----	----	1	8	256	208	0	2	2
New Hampshire	0	0	0	----	----	----	5	0	21	0	0	0
Vermont	0	1	0	----	----	----	15	121	17	1	1	0
Massachusetts	4	8	2	----	----	----	117	536	594	6	8	7
Rhode Island	0	0	0	59	21	----	5	381	161	0	5	1
Connecticut	0	4	1	2	6	6	191	522	307	4	12	1
MIDDLE ATLANTIC												
New York	9	14	19	[1] 4	[1] 9	[1] 12	94	2,659	1,941	29	67	12
New Jersey	2	1	3	9	9	13	44	1,497	1,417	10	18	4
Pennsylvania	11	9	10	3	3	----	149	1,323	1,323	26	40	8
E. N. CENTRAL												
Ohio	10	8	10	12	19	21	28	3,115	450	16	26	4
Indiana	10	3	5	5	12	32	40	222	222	7	12	2
Illinois	2	7	16	2	21	34	80	1,115	887	16	29	2
Michigan [3]	10	4	5	4	6	12	53	1,703	630	14	28	3
Wisconsin	0	3	2	27	113	113	41	1,919	873	3	9	1
W. N. CENTRAL												
Minnesota	2	5	1	----	3	3	11	1,658	240	2	7	1
Iowa	5	9	3	----	6	13	80	244	323	7	0	0
Missouri	4	4	4	2	5	8	4	365	365	8	20	0
North Dakota	4	0	1	1	13	13	3	184	102	2	0	0
South Dakota	6	4	3	----	7	1	15	116	11	2	0	0
Nebraska	1	4	2	1	4	7	25	153	153	1	2	1
Kansas	10	5	5	1	6	20	25	746	522	3	8	2
SOUTH ATLANTIC												
Delaware	0	0	0	----	----	----	10	22	22	0	1	0
Maryland [3]	5	6	2	3	7	20	59	1,295	104	4	13	3
District of Columbia	0	1	0	----	11	2	12	150	72	0	4	2
Virginia	2	5	10	743	510	696	51	1,087	650	8	17	10
West Virginia	3	4	6	18	19	40	50	342	338	5	9	4
North Carolina	10	8	8	----	14	116	25	1,650	649	4	10	1
South Carolina	6	14	5	522	507	766	24	330	194	1	11	3
Georgia	7	6	5	25	62	181	55	777	320	2	6	0
Florida	11	1	1	1	10	10	81	215	207	10	3	2
E. S. CENTRAL												
Kentucky	4	2	8	1	159	80	4	95	95	4	11	2
Tennessee	7	7	7	70	163	163	98	405	330	11	26	2
Alabama	9	1	6	229	133	354	11	549	174	6	6	5
Mississippi [3]	8	9	6	----	----	----	----	----	----	4	23	3
W. S. CENTRAL												
Arkansas	[3] 11	6	5	[3] 107	147	215	[3] 47	248	152	[3] 9	4	1
Louisiana	7	3	4	2	314	42	110	210	136	7	5	2
Oklahoma	5	3	4	231	107	107	20	102	36	5	3	3
Texas	27	62	40	1,689	1,538	1,653	736	1,679	1,261	15	20	13
MOUNTAIN												
Montana	1	0	0	12	9	14	1	172	80	1	0	0
Idaho	5	1	0	2	----	----	1	86	85	0	2	2
Wyoming	0	1	0	25	2	10	7	27	48	0	1	0
Colorado	4	7	6	24	40	42	14	479	256	0	2	1
New Mexico	2	1	1	----	12	3	2	50	50	0	0	0
Arizona	0	0	2	78	142	157	8	473	170	0	2	0
Utah [3]	0	0	1	43	110	9	93	26	178	0	1	0
Nevada	0	0	0	8	5	----	9	0	0	0	0	0
PACIFIC												
Washington	9	2	2	4	9	7	129	180	253	6	8	2
Oregon	3	3	1	8	42	40	45	97	418	5	3	0
California	25	19	19	21	104	148	953	1,598	721	20	32	3
Total	261	265	275	3,998	4,439	5,036	3,688	31,179	21,511	284	517	88
10 weeks	[3] 3,162	2,547	2,951	[3] 43,198	310,953	133,764	[3] 20,173	207,252	136,443	[3] 2,548	5,590	661

[1] New York City only. [2] Period ended earlier than Saturday. [3] Delayed reports (included in cumulative totals only), January 27 to February 24.—Arkansas: Diphtheria 19; influenza 34; measles 175; meningococcus meningitis 10.

Telegraphic morbidity reports from State health officers for the week ended March 10, 1945, and comparison with corresponding week of 1944 and 5-year median—Con.

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever[4]		
	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44
	Mar. 10, 1945	Mar. 11, 1944		Mar. 10, 1945	Mar. 11, 1944		Mar. 10, 1945	Mar. 11, 1944		Mar. 10, 1945	Mar. 11, 1944	
NEW ENGLAND												
Maine	0	0	0	53	20	18	0	0	0	0	0	0
New Hampshire	0	0	0	9	17	7	0	0	0	0	0	0
Vermont	0	0	0	23	12	5	0	0	0	0	0	0
Massachusetts	1	0	0	376	420	381	0	0	0	2	1	0
Rhode Island	0	0	0	42	18	16	0	0	0	0	0	0
Connecticut	0	0	0	91	110	69	0	0	0	0	1	1
MIDDLE ATLANTIC												
New York	14	2	1	581	616	536	0	0	0	2	6	4
New Jersey	0	0	0	171	261	261	0	0	0	0	0	1
Pennsylvania	0	0	1	710	637	430	0	0	0	8	3	5
EAST NORTH CENTRAL												
Ohio	2	1	1	442	404	397	0	0	0	0	2	3
Indiana	0	0	0	152	184	161	0	1	2	3	3	1
Illinois	1	0	0	429	447	447	0	0	1	1	1	1
Michigan[3]	0	0	0	361	276	276	1	0	0	0	1	3
Wisconsin	0	1	0	319	369	170	0	0	1	0	0	0
WEST NORTH CENTRAL												
Minnesota	0	0	0	115	193	98	0	0	0	0	0	0
Iowa	0	0	0	101	233	65	0	3	3	0	1	1
Missouri	0	0	0	100	113	123	1	0	1	1	0	1
North Dakota	0	0	0	38	55	25	0	0	0	0	0	0
South Dakota	0	0	0	16	40	22	0	0	0	1	0	0
Nebraska	0	1	0	81	113	34	0	0	0	0	0	0
Kansas	1	1	0	127	101	90	0	0	1	0	1	1
SOUTH ATLANTIC												
Delaware	0	0	0	12	7	14	0	0	0	0	0	0
Maryland[3]	0	0	0	252	268	70	0	0	0	0	0	1
District of Columbia	0	0	0	65	239	26	0	0	0	0	0	0
Virginia	1	0	0	142	98	53	0	0	0	1	4	3
West Virginia	1	1	1	66	63	48	0	0	0	0	0	1
North Carolina	1	0	0	97	34	43	0	0	0	0	0	1
South Carolina	0	0	0	17	8	8	0	1	0	1	5	1
Georgia	2	0	0	34	23	22	0	0	0	2	2	2
Florida	0	0	0	7	7	8	0	0	0	1	1	3
EAST SOUTH CENTRAL												
Kentucky	1	0	0	40	76	76	0	0	0	0	1	1
Tennessee	3	0	0	97	113	76	0	1	0	2	0	1
Alabama	0	1	1	16	3	13	0	0	0	1	0	1
Mississippi[3]	1	0	0	47	11	11	2	3	0	2	3	1
WEST SOUTH CENTRAL												
Arkansas	0	0	0	[5] 27	16	10	2	0	2	1	1	1
Louisiana	1	0	0	13	7	7	0	0	0	3	0	2
Oklahoma	0	0	0	25	14	15	0	0	2	1	1	1
Texas	4	4	0	114	64	58	0	3	1	1	5	3
MOUNTAIN												
Montana	0	0	0	14	65	40	0	0	0	1	0	0
Idaho	0	0	0	58	40	8	0	0	0	0	0	0
Wyoming	0	0	0	94	2	9	0	0	0	0	0	0
Colorado	0	0	0	82	53	43	1	0	1	3	0	0
New Mexico	0	0	0	27	10	9	0	0	0	2	0	0
Arizona	0	0	0	31	20	4	0	0	0	3	0	1
Utah[3]	0	0	0	69	122	27	0	0	0	0	6	1
Nevada	0	0	0	17	2	2	1	0	0	0	0	0
PACIFIC												
Washington	0	3	1	95	364	35	0	0	0	0	1	1
Oregon	0	1	1	30	125	12	0	0	0	0	2	2
California	0	3	2	488	452	156	0	0	0	0	0	2
Total	34	19	18	6,413	6,945	5,024	8	12	19	43	46	58
10 weeks	375	243	276	[6] 54,810	54,358	39,658	94	136	264	568	746	739

[3] Period ended earlier than Saturday. [4] Including paratyphoid fever reported separately, as follows: Massachusetts 1; Georgia 2. [5] Delayed reports (included in cumulative total only), January 27 to February 24.—Arkansas: Scarlet fever 50.

Telegraphic morbidity reports from State health officers for the week ended March 10, 1945, and comparison with corresponding week of 1944 and 5-year median—Con.

Division and State	Whooping cough			Week ended Mar. 10, 1945							
	Week ended—		Median 1940–44	Dysentery			Encephalitis, infectious	Rocky Mt. spotted fever	Tularemia	Typhus fever	Undulant fever
	Mar. 10, 1945	Mar. 11, 1944		Amebic	Bacillary	Unspecified					
NEW ENGLAND											
Maine	24	28	51	0	0	0	0	0	0	0	3
New Hampshire	5	0	3	0	0	0	0	0	0	0	0
Vermont	65	31	31	0	0	0	0	0	0	0	0
Massachusetts	134	77	197	1	2	0	1	0	0	0	2
Rhode Island	39	1	12	0	0	0	2	0	0	0	0
Connecticut	67	35	49	0	0	0	0	0	0	0	3
MIDDLE ATLANTIC											
New York	261	149	404	0	14	0	2	0	0	0	2
New Jersey	[6] 123	55	108	2	0	0	1	0	0	0	0
Pennsylvania	119	141	314	0	0	0	0	0	0	0	4
EAST NORTH CENTRAL											
Ohio	125	65	150	0	0	0	0	0	0	0	1
Indiana	10	17	27	0	0	0	0	0	0	0	0
Illinois	60	53	138	0	4	0	2	0	0	0	2
Michigan [3]	147	93	164	1	3	0	0	0	0	0	3
Wisconsin	66	75	145	0	0	0	0	0	1	0	3
WEST NORTH CENTRAL											
Minnesota	20	12	59	1	0	0	0	0	0	0	7
Iowa	2	8	23	0	0	0	0	0	0	0	15
Missouri	14	9	22	0	0	0	0	0	0	0	0
North Dakota	0	3	8	0	0	0	0	0	0	0	0
South Dakota	1	6	6	0	0	0	0	0	0	0	3
Nebraska	14	27	8	0	0	0	0	0	0	0	0
Kansas	49	31	38	0	0	0	1	0	2	0	7
SOUTH ATLANTIC											
Delaware	2	2	2	0	0	0	0	0	0	0	0
Maryland [3]	41	38	59	1	0	0	0	0	0	0	1
District of Columbia	2	3	24	0	0	0	0	0	0	0	0
Virginia	44	70	74	0	0	55	0	0	1	0	0
West Virginia	33	23	32	[6] 0	0	0	0	0	0	0	0
North Carolina	95	122	122	0	0	0	0	0	1	0	1
South Carolina	107	58	58	1	2	0	0	0	0	1	0
Georgia	16	9	28	0	1	0	0	0	4	6	3
Florida	18	31	14	[6] 2	1	0	0	0	0	3	0
EAST SOUTH CENTRAL											
Kentucky	30	90	72	0	0	0	0	0	0	0	1
Tennessee	37	28	36	1	0	1	0	0	0	1	0
Alabama	19	49	23	0	0	0	0	0	0	3	3
Mississippi [3]	----	----	----	0	0	0	0	0	1	4	2
WEST SOUTH CENTRAL											
Arkansas	29	26	19	[6] 0	[6] 0	0	0	0	0	0	0
Louisiana	5	2	2	2	0	0	0	0	0	3	2
Oklahoma	20	2	9	1	0	0	0	0	0	0	2
Texas	313	176	217	7	257	19	0	0	0	14	12
MOUNTAIN											
Montana	5	3	6	0	0	0	0	0	0	0	0
Idaho	4	1	1	0	0	0	0	0	0	0	0
Wyoming	6	5	3	0	0	10	0	0	0	0	0
Colorado	32	25	25	0	1	0	0	0	0	0	4
New Mexico	8	3	19	0	0	0	0	0	0	0	0
Arizona	21	43	20	0	0	13	0	0	0	0	0
Utah [3]	27	26	69	0	0	0	0	0	0	0	2
Nevada	1	1	6	0	0	0	0	0	0	0	0
PACIFIC											
Washington	26	35	35	0	0	0	0	0	0	0	2
Oregon	30	36	36	0	0	0	0	0	0	0	0
California	298	94	277	0	6	0	0	0	0	1	4
Total	2,614	1,917	3,911	20	291	98	9	0	10	36	94
Same week, 1944	1,917	----	----	33	159	71	11	0	9	32	61
Average, 1942–44	3,248	----	----	45	175	58	10	[7] 0	13	[7] 31	41
10 weeks, 1945	[6] 23,430	----	----	[6] 266	[6] 5,358	1,379	66	4	208	547	854
1944	18,335	----	----	249	2,032	648	102	2	101	417	380
Average, 1942–44	32,401	----	[7] 38,789	223	1,620	463	92	[7] 4	165	[7] 417	301

[3] Period ended earlier than Saturday. [6] Delayed reports (included in cumulative totals only), January 27 to February 24.—Arkansas: Dysentery, amebic 2, bacillary 1. New Jersey, week ended February 3: Whooping cough 81. Florida, week ended January 27: Amebic dysentery 2. West Virginia, week ended February 3: Amebic dysentery 1. [7] 5-year median, 1940–44.

Anthrax; New York, 1 case; Pennsylvania, 1 case. *Leprosy:* Louisiana, 1 case. *Rabies in man:* Nort Carolina, 1 case. *Weil's disease:* Idaho, 1 case; Alaska, 31 cases.

WEEKLY REPORTS FROM CITIES

City reports for week ended March 3, 1945

This table lists the reports from 89 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine:												
Portland	0	0	------	0	1	0	5	1	1	0	0	2
New Hampshire:												
Concord	0	0	------	0	0	0	0	0	0	0	0	0
Vermont;												
Barre	0	0	------	0	0	0	0	0	0	0	0	4
Massachusetts:												
Boston	1	0	------	2	37	4	13	0	73	0	1	38
Fall River	0	0	------	0	1	0	2	0	6	0	0	0
Springfield	0	0	------	0	1	0	0	0	6	0	0	1
Worcester	0	0	------	0	2	0	14	0	5	0	0	3
Rhode Island:												
Providence	0	0	1	0	1	0	3	0	10	0	1	31
Connecticut:												
Bridgeport	0	0	------	0	0	0	0	0	7	0	0	0
Hartford	1		------	0	65	0	0	0	27	0	0	0
New Haven	0	0	------	0	2	0	1	0	2	0	0	2
MIDDLE ATLANTIC												
New York:												
Buffalo	0	0	------	0	0	0	5	0	8	0	0	4
New York	11	0	3	2	38	22	84	0	301	0	0	88
Rochester	0	0	------	0	8	0	3	0	10	0	4	14
Syracuse	0	0	------	0	0	3	4	0	3	0	0	23
New Jersey:												
Camden	1	0	------	1	1	0	2	0	2	0	0	0
Newark	0	0	------	1	5	3	7	0	30	0	1	6
Trenton	0	0	1	0	4	0	3	0	14	0	0	0
Pennsylvania:												
Philadelphia	1	0	2	0	49	5	45	0	108	0	2	50
Pittsburgh	1	0	------	0	2	3	8	0	24	0	1	10
Reading	0	0	------	0	3	0	1	0	2	0	0	0
EAST NORTH CENTRAL												
Ohio:												
Cincinnati	0	0	------	0	0	2	17	0	16	0	0	4
Cleveland	0	0	8	0	6	4	8	0	74	0	0	48
Columbus	0	0	------	0	1	0	4	0	6	0	0	12
Indiana:												
Fort Wayne	0	0	------	0	1	0	0	0	13	2	0	1
Indianapolis	3	0	------	0	5	0	10	0	45	0	0	0
South Bend	0	0	------	0	0	0	0	0	4	0	0	2
Terre Haute	0	0	------	0	0	0	2	0	4	0	0	0
Illinois:												
Chicago	0	0	1	1	40	8	31	0	147	0	0	29
Springfield	0	1	------	0	4	1	3	0	17	0	0	0
Michigan:												
Detroit	2	0	1	4	20	7	15	0	113	0	0	22
Flint	0	0	------	0	0	0	1	0	14	0	0	0
Grand Rapids	0	0	------	0	3	0	0	0	13	0	0	1
Wisconsin:												
Kenosha	0	0	------	0	1	0	0	0	5	0	0	3
Milwaukee	0	0	------	0	6	2	3	0	71	0	0	2
Racine	0	0	------	0	0	0	2	0	3	0	0	2
Superior	0	0	------	0	2	0	0	0	4	0	0	1
WEST NORTH CENTRAL												
Minnesota:												
Duluth	0	0	------	0	0	1	0	1	7	0	0	3
Minneapolis	2	0	------	0	3	0	4	0	22	0	0	16
St. Paul	1	0	------	0	0	0	8	0	3	0	0	13
Missouri:												
Kansas City	0	0	------	0	4	1	8	0	19	0	0	1
St. Joseph	0	0	------	0	0	0	0	0	12	1	0	0
St. Louis	1	1	4	3	1	4	14	0	39	0	0	8

City reports for week ended March 3, 1945—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
WEST NORTH CENTRAL—continued												
North Dakota:												
Fargo	0	0	-----	0	0	0	0	0	1	0	0	0
Nebraska:												
Omaha	0	1	-----	0	10	0	6	0	20	0	0	0
Kansas:												
Topeka	1	0	-----	0	1	0	3	0	13	0	0	8
Wichita	0	1	-----	0	0	0	3	0	4	0	0	6
SOUTH ATLANTIC												
Delaware:												
Wilmington	0	0	-----	0	1	0	5	0	0	0	0	0
Maryland:												
Baltimore	5	0	3	2	2	1	16	0	118	0	0	26
Cumberland	0	0	-----	0	0	0	0	0	6	0	0	2
Frederick	0	0	-----	0	0	0	0	0	1	0	0	0
District of Columbia:												
Washington	0	0	1	0	8	1	12	0	61	0	0	2
Virginia:												
Lynchburg	0	0	-----	0	0	0	0	0	4	0	0	0
Richmond	0	0	2	1	2	1	3	0	5	0	0	0
Roanoke	1	0	-----	1	0	0	0	0	2	0	0	0
West Virginia:												
Charleston	0	0	-----	0	0	0	0	0	1	0	0	2
Wheeling	0	0	-----	0	22	0	2	0	3	0	0	0
North Carolina:												
Raleigh	0	0	-----	0	1	0	1	0	1	0	0	11
Wilmington	0	0	-----	0	0	0	3	0	1	0	0	5
Winston-Salem	0	0	-----	0	1	0	2	0	18	0	0	3
South Carolina:												
Charleston	0	0	27	0	3	2	0	0	0	0	0	0
Georgia:												
Atlanta	0	0	2	0	0	0	6	0	17	0	0	0
Brunswick	0	0	-----	0	2	0	1	0	2	0	0	3
Florida:												
Tampa	0	0	-----	0	1	0	2	0	4	0	0	4
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	1	0	3	3	72	0	7	0	10	0	0	2
Nashville	0	0	-----	2	1	2	6	0	11	0	0	2
Alabama:												
Birmingham	0	0	18	0	0	0	5	0	4	0	0	0
Mobile	1	0	-----	0	0	0	3	0	0	0	0	0
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	0	0	3	0	6	0	1	0	6	0	0	5
Louisiana:												
New Orleans	2	0	-----	0	1	0	4	1	9	0	0	0
Shreveport	0	0	-----	0	0	0	4	0	1	0	0	0
Texas:												
Dallas	1	0	-----	0	8	1	5	0	2	0	1	3
Galveston	2	0	-----	0	0	0	6	0	0	0	0	0
Houston	1	0	-----	0	3	1	3	1	6	0	0	0
San Antonio	2	0	1	0	0	0	5	0	4	0	0	0
MOUNTAIN												
Montana:												
Billings	0	0	-----	0	2	0	0	0	0	0	0	0
Great Falls	0	0	-----	0	0	0	0	0	0	0	0	0
Helena	0	0	-----	0	0	0	0	0	3	0	0	0
Missoula	0	0	-----	0	0	0	1	0	3	0	0	0
Idaho:												
Boise	0	0	-----	0	0	0	1	0	1	0	0	0
Colorado:												
Denver	4	0	1	0	4	0	6	0	28	0	0	16
Pueblo	0	0	-----	0	0	0	0	0	4	0	0	0
Utah:												
Salt Lake City	0	0	-----	1	28	0	4	0	13	0	0	12

City reports for week ended March 3, 1945—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
PACIFIC												
Washington:												
Seattle	0	0	------	1	28	0	5	0	31	0	0	2
Spokane	2	0	2	0	1	0	0	0	5	0	0	0
Tacoma	0	0	------	0	4	0	1	0	6	0	0	3
California:												
Los Angeles	5	0	17	0	26	2	5	0	92	0	0	33
Sacramento	0	0	------	0	5	1	0	0	16	0	0	24
San Francisco	3	0	1	0	100	0	6	0	55	0	0	11
Total	56	4	102	25	660	82	473	4	1,882	3	11	629
Corresponding week, 1943	101	------	204	50	8,763	------	508	------	2,258	0	7	324
Average, 1940–44	71	------	381	[1] 48	[2] 5,165	------	[1] 523	------	1,671	1	12	885

[1] 3-year average, 1942–44.
[2] 5-year median, 1940–44.

† *Dysentery, amebic.*—Cases: New York, 2; Rochester, 1; Chicago, 1; Wilmington, Del., 1.
Dysentery, bacillary.—Cases: Providence, 2; Buffalo, 16; New York, 5; Cincinnati, 1; St. Louis, 1; Topeka, 1; Charleston, S. C., 2; Nashville, 1; Los Angeles, 3.
Dysentery, unspecified.—Cases: Cincinnati, 1; San Antonio, 4.
Leprosy.—Cases: New Orleans, 1; San Antonio, 1.
Tularemia.—Cases: Nashville, 1.
Typhus fever, endemic.—Cases: Tampa, 1; Nashville, 1; Birmingham, 2; Houston, 1; San Antonio, 1; Los Angeles, 3.

Rates (annual basis) per 100,000 population, by geographic groups, for the 89 cities in the preceding table (estimated population, 1943, 34,274,500)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza		Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
			Case rates	Death rates								
New England	5.2	0.0	2.6	5.2	288	10.5	99.3	2.6	358	0.0	5.2	212
Middle Atlantic	6.5	0.0	2.8	1.9	51	16.7	75.0	0.0	232	0.0	3.7	90
East North Central	3.0	0.6	6.1	3.0	54	14.6	58.4	0.0	334	1.2	0.0	77
West North Central	9.9	6.0	8.0	6.0	38	11.9	91.5	2.0	279	2.0	0.0	109
South Atlantic	10.2	0.0	59.4	6.8	73	8.5	90.0	0.0	414	0.0	0.0	99
East South Central	11.8	0.0	123.9	29.5	431	11.8	123.9	0.0	148	0.0	0.0	24
West South Central	23.0	0.0	11.5	0.0	52	5.7	80.3	5.7	80	0.0	2.9	23
Mountain	31.8	0.0	7.9	7.9	270	0.0	95.3	0.0	413	0.0	0.0	222
Pacific	15.8	0.0	31.6	1.6	259	4.7	26.9	0.0	324	0.0	0.0	115
Total	8.5	0.6	15.6	3.8	101	12.5	72.2	0.6	287	0.5	1.7	96

TERRITORIES AND POSSESSIONS

Puerto Rico

Notifiable diseases—4 weeks ended February 24, 1945.—During the 4 weeks ended February 24, 1945, cases of certain notifiable diseases were reported in Puerto Rico as follows:

Disease	Cases	Disease	Cases
Bilharziasis	3	Ophthalmia neonatorum	1
Chickenpox	28	Puerperal fever	2
Diphtheria	37	Syphilis	570
Dysentery (unspecified)	4	Tetanus	12
Filariasis	2	Tetanus, infantile	1
German measles	15	Trachoma	2
Gonorrhea	665	Tuberculosis (all forms)	586
Influenza	122	Typhoid fever	20
Leprosy	1	Typhus fever (murine)	2
Malaria	731	Undulant fever	1
Measles	329	Weil's disease	11
Mumps	1	Whooping cough	159

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended February 17, 1945.—During the week ended February 17, 1945, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox		4		164	330	83	24	87	116	808
Diphtheria		6	4	37	3	11	4		1	66
German measles		11		15	12	1	2	3	26	70
Influenza		28			107					135
Measles				117	93	14	14	18	397	653
Meningitis, meningococcus		1		1	2				1	5
Mumps				312	140	66	25	82	23	648
Scarlet fever	1	8	4	115	111	28	12	49	33	361
Tuberculosis (all forms)		2	1	182	35	9	8	16	43	296
Typhoid and paratyphoid fever				10	1					11
Undulant fever				1	4		2			7
Venereal diseases:										
Gonorrhea	4	25	20	83	136	13	36	35	44	396
Syphilis	1	10	13	119	99	17	9	14	24	306
Whooping cough		13		273	71	13	5	18	25	418

PERU

Notifiable diseases—July–September 1944.—During the months of July, August, and September 1944, cases of certain notifiable diseases were reported in Peru as follows:

Disease	July	August	September	Disease	July	August	September
Cerebrospinal meningitis	3	1	3	Scarlet fever	21	7	7
Chickenpox		85	119	Smallpox	5	28	210
Diphtheria	105	97	79	Syphilis	470	486	465
Dysentery (unspecified)	580	516	577	Tuberculosis	1,642	1,386	1,546
Gonorrhea	611	623	175	Typhoid and paratyphoid fever	276	204	265
Influenza	2,966	3,046	2,677	Typhus fever	104	102	191
Leprosy	9	17	11	Typhus fever, recurrent	14	10	36
Lethargic encephalitis	1	2	1	Undulant fever	58	61	82
Malaria	6,171	5,711	8,176	Veruga peruana	84	93	52
Measles	424	615	699	Whooping cough	1,877	2,511	3,469
Plague		2	4				
Poliomyelitis	1	3	4				

WORLD DISTRIBUTION OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From medical officers of the Public Health Service, American consuls, International Office of Public Health, Pan American Sanitary Bureau, health section of the League of Nations, and other sources. The reports contained in the following tables must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

CHOLERA

[C indicates cases]

NOTE.—Since many of the figures in the following tables are from weekly reports, the accumulated totals are for approximate dates.

Place		January-December 1944	January 1945	February 1945—week ended—			
				3	10	17	24
ASIA							
Ceylon	C	2					
India	C	217,563					
Calcutta	C	3,606	98	23	17		
Chittagong	C	64			1		
Madras	C	41	16	8	3		
Negapatam	C	17					
Vizagapatam	C	269					

PLAGUE

[C indicates cases; D, deaths; P, present]

Place							
AFRICA							
Algeria	C	67	[1] 12				
Bechuanaland	C	[2] 399					
Belgian Congo	C	36	2				1
Plague-infected rats		P					
British East Africa:							
Kenya	C	15	2				
Uganda	C	8	2				
Egypt	C	644					
Port Said	C	76					
Suez	C	163		1		1	
French West Africa: **Dakar**	C	562	1		2		
Madagascar	C	184	27				
Morocco (French)	C	227	35				[3] 12
Rhodesia, northern	C	1					
Senegal	C	87	53		1		
Sudan (French)	D	1					
Tunisia	C	65	1		1		
Union of South Africa	C	80	1			3	
ASIA							
China:							
Chekiang Province	C	P					
Foochow	C	P					
Kiangsi Province	C	104					
India	C	14,606					
Indochina	C	57					
Iraq: Amara Province	C			4		7	
Palestine	C	86	3				
Plague-infected rats		201	12				
EUROPE							
Portugal: Azores	C	29	1				
SOUTH AMERICA							
Bolivia:							
Chuquisaca Department	C	5					
Santa Cruz Department	C	5					
Tarija Department	C	12					
Brazil	C	[4] 111					
Ecuador:							
Chimborazo Province	C	4					
Loja Province	C	12					
Peru:							
Ancash Department	C	63					
Lambayeque Department	C	1					
Libertad Department	C	12					
Lima Department	C	29					
Piura Department	C	2					
OCEANIA							
Hawaii Territory:							
Hamakua District	D	[5] 5					
Plague-infected rats [6]		[7] 59					

[1] Includes 1 case of pneumonic plague.
[2] From the beginning of the outbreak in October 1944.
[3] For the month of February 1945.
[4] For the period January 1 to Aug. 31, 1944.
[5] Includes 1 death from pneumonic plague.
[6] Plague infection was also proved in a pool of 53 fleas on Mar. 7, 1944, in another pool of 75 fleas on Dec. 7, 1944, in a pool of rats on Dec. 17, 1944, in tissue from a pool of 8 mice on Aug. 20, 1944, and in a pool of 5 mice on Jan. 4, 1945.
[7] Includes 12 plague-infected mice.

SMALLPOX

[C indicates cases]

Place		January-December 1944	January 1945	February 1945—week ended—			
				3	10	17	24
AFRICA							
Algeria	C	1,060	39		9		
Angola	C	131					
Basutoland	C	203	2				
Belgian Congo	C	4,355	345				
British East Africa:							
Kenya	C	3,270	33	12			
Mombasa	C	150					
Tanganyika	C	2,637	47				
Uganda	C	4,505	63				
Cameroon (French)	C	999	26			10	
Dahomey	C	89	4				
Egypt	C	11,059	59	36			
French Equatorial Africa	C	2,344	956			151	
French Guinea	C	1,246	138		45	64	
French West Africa	C	224	85		18	16	
Gambia	C	15		2			
Gold Coast	C	107					
Ivory Coast	C	489			7		
Mauritania	C	2					
Morocco (French)	C	788	10				[1] 31
Mozambique	C	5					
Nigeria	C	5,105	471				
Niger Territory	C	628	39		9		
Rhodesia, northern	C	352					
Senegal	C	193	8		40	36	
Sierra Leone	C	416					
Sudan (Anglo-Egyptian)	C	2					
Sudan (French)	C	2,050	140		128	111	
Togo (British)	C	90					
Togo (French)	C	161			21		
Tunisia	C	11					
Union of South Africa	C	2,238	12				
ASIA							
Arabia	C	[2] 32					
Ceylon	C	91	[3] 68			[4] 164	
China: Kunming (Yunnan Fu)	C	54					
India	C	257,938					
Indochina	C	1,557					
Iran	C	792					
Iraq	C	54					
Palestine	C	165					
Syria and Lebanon	C	182	5				
Trans-Jordan	C	2					
EUROPE							
France	C	3	1				--
Gibraltar	C	24					
Great Britain	C	[4] 18					
Greece	C	321					
Italy	C	1,566	81	28	27		
Portugal	C	59			1		
Spain	C	194	9				18
Turkey	C	6,083	88	2	13	8	
NORTH AMERICA							
Canada	C				1		5
Dominican Republic	C	1					
Guatemala	C	37					
Honduras	C	9					
Mexico	C	2,856	115				
Panama (Republic)	C	2					
SOUTH AMERICA							
Bolivia	C	1,159					
Brazil	C	8,085	29				
Chile	C	30					
Colombia	C	1,531	6	4	2	4	
Ecuador	C	29	7				
Peru	C	522					
Lima	C	31					
Venezuela	C	584	93				

[1] For the month of February 1945.
[2] Includes imported cases.
[3] Includes some cases of chickenpox.
[4] For the period Jan. 18 to Feb. 14, 1945.
[5] Includes 1 case imported from the Middle East.

TYPHUS FEVER*

[C indicates cases]

Place		January–December 1944	January 1945	February 1945—week ended— 3	10	17	24
AFRICA							
Algeria	C	1,770	119		74		
Basutoland	C	102					
Belgian Congo	C	101	4				
British East Africa: Kenya	C	16	9				
Mombasa	C	[1] 8					
Egypt	C	18,533	633	207			
French Equatorial Africa	C	2					
French Guinea	C	2					
French West Africa: Dakar [2]	C	60					
Gold Coast	C	7					
Libya: Tripolitania	C	5					
Morocco (French)	C	2,928	305				[3] 674
Morocco (Spanish)	C	11					
Mozambique	C	4					
Nigeria	C	2					
Rhodesia, northern	C	151					
Sierra Leone	C	33					
Sudan (Ango-Egyptian)	C	3					
Tunisia	C	1,007	44		1	8	
Union of South Africa	C	6,143					
ASIA							
Arabia: Western Aden Protectorate	C	[4] 16					
Ceylon	C	1					
China: Kunming (Yunnan Fu)	C	141	2				
India	C	31					
Indochina	C	1,004					
Iran	C	6,436					
Iraq	C	627					
Palestine	C	504	4				
Syria and Lebanon	C	428					
Trans-Jordan	C	49					
EUROPE							
Belgium	C	10					
Bulgaria	C	702					
France	C	11					
Germany	C	2,467					
Gibraltar	C	6		1	1		
Greece	C	388					
Hungary	C	3,336					
Irish Free State	C	9					
Italy	C	10	5				
Malta and Gozo [2]	C	18			[1]		
Netherlands	C	8					
Norway	C	1					
Portugal	C	33	13		3		
Rumania	C	[5] 6,000					
Slovakia	C	347					
Spain	C	498					
Turkey	C	3,121	375	81	128	86	79
Yugoslavia	C	8,243					
NORTH AMERICA							
Costa Rica [2]	C	2					
Cuba [2]	C	2	1				
Dominican Republic	C	10					
Guatemala	C	2,144	183				
Jamaica	C	60	2	1			
Mexico	C	1,951					
Panama Canal Zone	C	1					
Puerto Rico [2]	C	187	3			2	
Salvador	C	7					
Virgin Islands [2]	C	20					
SOUTH AMERICA							
Bolivia	C	369					
Brazil	C	4	1				
Chile	C	550	9				
Colombia [2]	C	628					
Curacao	C	6					
Ecuador	C	580	44				
Peru	C	1,315					
Venezuela	C	105	6				
OCEANIA							
Australia [2]	C	189	14				
Hawaii Territory [2]	C	163	10		1	2	

*Reports from some areas are probably murine type, while others probably include both murine and louse-borne types.

[1] Reported as tick typhus, probably boutonneuse fever.

[2] Reports cases as murine type.

[3] For the month of February 1945.

[4] A report dated Mar. 30, 1944, states that an estimated 800 deaths from typhus fever have been reported in Western Aden Protectorate, Arabia.

[5] For the period Jan. 1 to May 7, 1944.

YELLOW FEVER

[C indicates cases; D, deaths]

Place		January–December 1944	January 1945	February 1945—week ended—			
				3	10	17	24
AFRICA							
Belgian Congo:							
Babeyru	D	2					
Banzyville	C	[1] 13					
Bondo	D	1					
Leopoldville	C	1					
Gold Coast:							
Cape Coast	C	[2] 1					
Ho	C	[2] 1					
Kintampo	C	1					
Northern Territories	C	1					
Nsawam	C	1					
Sekondi	C	[2] 1					
Tamale	C	[2] 1					
Yendi	C	[2] 1					
Ivory Coast:							
Abidjan	C	1					
Divo	C	1					
Nigeria: Bukuru	C	1					
Portuguese Guinea: Port Bintam	C	1					
EUROPE							
Portugal: Lisbon.[3]							
SOUTH AMERICA							
Bolivia:							
La Paz Department	C	1					
Santa Cruz Department	C	3					
Brazil:							
Acre Territory	D	1					
Goiaz State	D	4	[4] 34				
Matto Grosso State	D	3					
Para State	D	2					
Colombia:							
Amazonas Department	D	1					
Boyaca Department	D	4					
Caldas Department	D	1					
Cundinamarca Department	D	1					
Intendencia of Meta	C	1					
Santander Department	D	4					
Santander del Norte Department	D	2	2				
Venezuela:							
Barinas State	C	2					
Bolivar State	D	1					
Tachira State	C	[5] 30	1				

[1] Includes 11 cases of suspected yellow fever.
[2] Suspected.
[3] According to information dated Jan. 21, 1944, it is reported that a vessel which called at the islands of Sao Tome and Cape Verde arrived at Lisbon, Portugal, with cases of yellow fever on board.
[4] Includes some deaths reported during December 1944.
[5] Includes 21 cases of suspected yellow fever.

DEATHS DURING WEEK ENDED MARCH 3, 1945

[From the Weekly Mortality Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Mar. 3, 1945	Corresponding week, 1944
Data from 93 large cities of the United States:		
Total deaths	9,884	9,852
Average for 3 prior years	9,688	
Total deaths, first 9 weeks of year	88,276	94,124
Deaths under 1 year of age	689	598
Average for 3 prior years	660	
Deaths under 1 year of age, first 9 weeks of year	5,752	5,715
Data from industrial insurance companies:		
Policies in force	67,032,846	66,338,603
Number of death claims	16,293	14,433
Death claims per 1,000 policies in force, annual rate	12.7	11.4
Death claims per 1,000 policies, first 9 weeks of year, annual rate	10.7	11.6

COURT DECISION ON PUBLIC HEALTH

Retailer held liable for illness following discovery of worms in canned peaches.—(Ohio Supreme Court; *Wolfe* v. *Great Atlantic & Pacific Tea Co.* (two cases), 56 N.E.2d 230; decided July 26, 1944.) In two cases in which a mother and daughter were the plaintiffs, the evidence, briefly, was to the following effect: The mother purchased two cans of peaches from the defendant retailer; one of the cans was opened and each plaintiff had a helping; immediately thereafter each had a second portion and while eating the same the mother noticed a worm in a part of the peach which she was about to eat; she called her daughter's attention to this fact and thereupon the daughter found a worm in the syrup in her helping; both plaintiffs immediately became nauseated and vomited and remained ill for several days; the mother's nerves were upset and she suffered pain; neither plaintiff could eat solid food for several days. The jury found for the plaintiffs and the trial court entered judgment upon each verdict. In the Ohio Court of Appeals each of the cases was reversed and the plaintiffs carried them to the State supreme court.

The latter court quoted section 12760 of the Ohio General Code which made unlawful the sale of diseased, corrupted, adulterated, or unwholesome provisions without making the condition thereof known to the buyer and stated that it was of the opinion that the presence of worms in the can of peaches caused such peaches to be a corrupt and unwholesome provision. It cannot be denied, said the court, that worms in food will ordinarily produce nausea followed by vomiting where persons, especially women, have eaten of such food and such consequence should have been reasonably anticipated by those who offered such food for sale.

The court of appeals in its opinion had stated that neither plaintiff could recover because there was no evidence that either suffered any physical injury. The supreme court said that if there was no evidence of any physical injury the judgments of the court of appeals should be affirmed on the authority of a prior case in which the supreme court had held that, in a personal injury action involving ordinary negligence, no liability exists for fright and its consequences when such fright is unaccompanied by contemporaneous physical injury. With respect to the question of physical injury in the instant cases the supreme court's view was that, where the evidence disclosed that a plaintiff had eaten of an unwholesome provision sold in violation of section 12760 of the General Code and immediately after discovering worms in the uneaten portion of such provision became nauseated and vomited, followed by sickness, the question of whether the plaintiff suffered a physical injury was one of fact for the jury.

Another question presented was whether a retailer was liable in damages for the sale of unwholesome food where such food when sold was contained in an original package which did not admit of inspection of the contents by the retailer. As to this the supreme court said that ignorance of the unwholesome condition of the food was no excuse for the seller. Also it was no excuse that the seller chose to offer the food in a sealed container whereby he could not examine the contents. The seller's duty to warn the buyer could not be avoided by the excuse that he did not know that the provision was unwholesome and that it was impracticable to open the can and examine the provision. Section 12760 did not contain any exception respecting provisions in cans or other original packages and the supreme court said that it was not justified in reading such an exception into the statute.

The judgments of the court of appeals were reversed and the judgments of the trial court affirmed.

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FEDERAL SECURITY AGENCY

UNITED STATES PUBLIC HEALTH SERVICE

THOMAS PARRAN, *Surgeon General*

DIVISION OF PUBLIC HEALTH METHODS

G. ST. J. PERROTT, *Chief of Division*

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